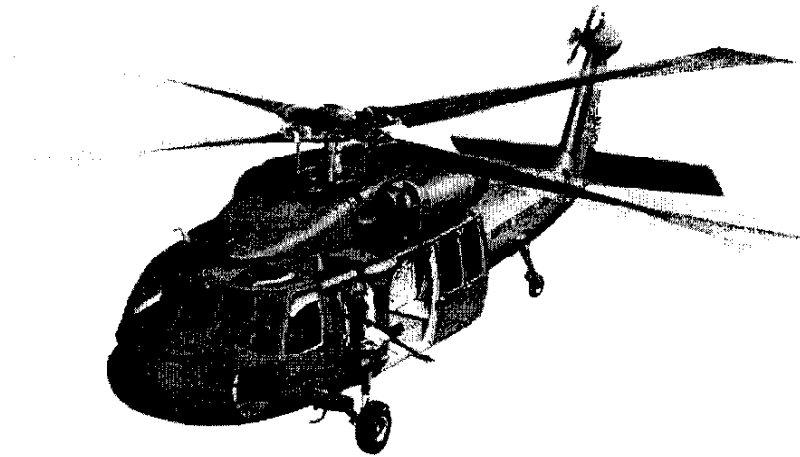


UH-60 BLACK HAWK RECAPITALIZATION SYSTEMS

PERFORMANCE PLAN AND AGREEMENT

July 3, 2002



GENERAL

Purpose.

To provide an overview of the goals and objectives of the UH-60 BLACK HAWK Recapitalization (Recap) program. This Performance Plan and Agreement (PPA) includes the metrics and means to evaluate the progress in achieving these goals.

Background.

The Sikorsky UH-60 BLACK HAWK was fielded in 1978 to provide air assault, general support, command and control, and aeromedical evacuation (MEDEVAC) capabilities. Between Fiscal Years (FY) 1978 and 1988, 982 UH-60As were produced. The UH-60L (upgraded engines and drive train) production began in FY89. As of the end of FY01, the Army had 1524 UH-60As and UH-60Ls in its utility and medical evacuation fleets.

System Deficiencies.

The average age of the fleet is already over 13 years old. The average UH-60A is over 18 years old and approximately 25 percent of the UH-60A fleet

is over 20 years old. This aging UH-60A/L fleet is experiencing a decrease in Operational Readiness (OR) and a corresponding increase in Operation and Support (O&S) costs. Performance has also decreased due to age and weight growth. First fielded in the 1970's, these older analog-based aircraft were not designed to meet the challenges of today's full-spectrum force. Evolving lift, range, interoperability, and survivability requirements cannot be met with the existing fleet. The avionics architecture is not compatible with mid-term or far-term (Joint Vision 2020) interoperability requirements.

UH-60 BLACK HAWK Recap Strategy.

a. In 1997, the Utility Helicopters Modernization Study was initiated to identify a fleet modernization approach to meet digitization/situational awareness requirements, extend aircraft life, reduce O&S costs, and to increase OR rates. Simultaneously, the UH-60 Modernization Operational Requirements Document (ORD) developed blocked capabilities to meet current and future requirements.

b. An Acquisition Category (ACAT) ID Milestone B Acquisition Decision Memorandum, authorizing the UH-60M Program to enter into the System Development and Demonstration (SDD) Phase, was signed in April 2001. This program recapitalizes and upgrades existing UH-60A/L aircraft into "near zero-time" UH-60M aircraft with digital cockpits. The SDD Phase began in April 2001. The Milestone C In-Process Review (IPR), scheduled for 2nd Qtr FY04, will provide authorization to begin production of Low Rate Initial Production (LRIP) aircraft. The Full-Rate Production (FRP) Decision Review (DR) is scheduled for 2nd Qtr FY06 with the First Unit Equipped (FUE) scheduled for 4th Qtr FY06.

c. While awaiting induction into the UH-60M Recap/Upgrade program, the UH-60A fleet continues to age and incur additional wear and tear, resulting in reduced readiness rates and increased O&S costs. An effort was initiated to address this issue as well as to determine the feasibility of improving the airframe areas and components not included in the UH-60M Program. This study evolved into the UH-60A to A Recap/Rebuild program. This program will rebuild 193 UH-60A aircraft to sustain the fleet until induction into the UH-60M Upgrade program as well as recapitalize aircraft components in support of both programs.

d. On May 31, 2001, the Army Acquisition Executive (AAE) and the Vice Chief of Staff of the Army (VCSA) authorized the Utility Helicopter Recap Strategy, which includes the Defense Acquisition Board (DAB)-approved UH-60M Program (a Recap/Upgrade effort), continuation of the UH-60L new procurement, and the UH-60A to A Recap/Rebuild effort.

UH-60 BLACK HAWK Recapitalization Program Metrics.

a. Each program contains performance-based measurements that will track the success of each initiative and form the basis for high-level

tracking and reporting. These metrics will allow the Army to gauge the benefits and illustrate the effects of the Recap program across the fleet.

b. The Business Process Improvement Directorate (BPI) will track and evaluate the success of the UH-60 BLACK HAWK Recap programs by:

1. Utilizing data provided by existing and future data collection systems including the Unit Level Logistics System-Aviation (ULLS-A) and the Global Combat Support System-Army (GCSS-A).

2. Utilizing existing data sources and leveraging the Army Material Systems Analysis Activity's (AMSAA) existing infrastructure and experience.

3. It should be noted that ULLS-A data is maintained at the unit level. Currently, there is no mechanism to migrate usable ULLS-A data to the wholesale level. This complicates the data collection effort, however we are investigating methodologies to collect this information. The fielding of GCSS-A will provide the required information to the Program Manager (PM)/Aviation and Missile Command (AMCOM) level.

4. Selected Recap components are expected to be tracked utilizing Department of the Army (DA) Form 2410 (Component Removal and Repair/Overhaul Record) methodology and procedures. Selected Recap components not currently reported by DA Form 2410 will be added to the program. The use of a separate Condition Code to identify Recapped components at the Item Manager level as well as in storage locations is being pursued by AMCOM. This will help ensure the shipment of Recap items to units with Recapped aircraft. Evolving Automatic Identification Technology (AIT) will be used as an enabler for data collection. Details on the collection of data will be included in the Program Data Collection Plan (DCP). The DCP is being developed and is a requirement for entering the Production and Fielding Phase.

UH-60A TO A RECAP/REBUILD PROGRAM

Program Description.

- a. The UH-60A to A Recap/Rebuild program is the initial step in the accomplishment of the Utility Helicopter Recapitalization Strategy. The UH-60A to A Recap program incorporates a series of cost benefit analyses (airframe and component) to identify those efforts that should be accomplished immediately and others that should be deferred to the UH-60M Recap/Upgrade program. The UH-60A to A Recap/Rebuild effort is an Operations and Maintenance Army (OMA) funded program. It will Recap/Rebuild 193 UH-60A model aircraft to the updated Depot Maintenance Work Requirement (DMWR)/National Maintenance

Work Requirement (NMWR) configuration baseline standards. The objectives of this program are to:

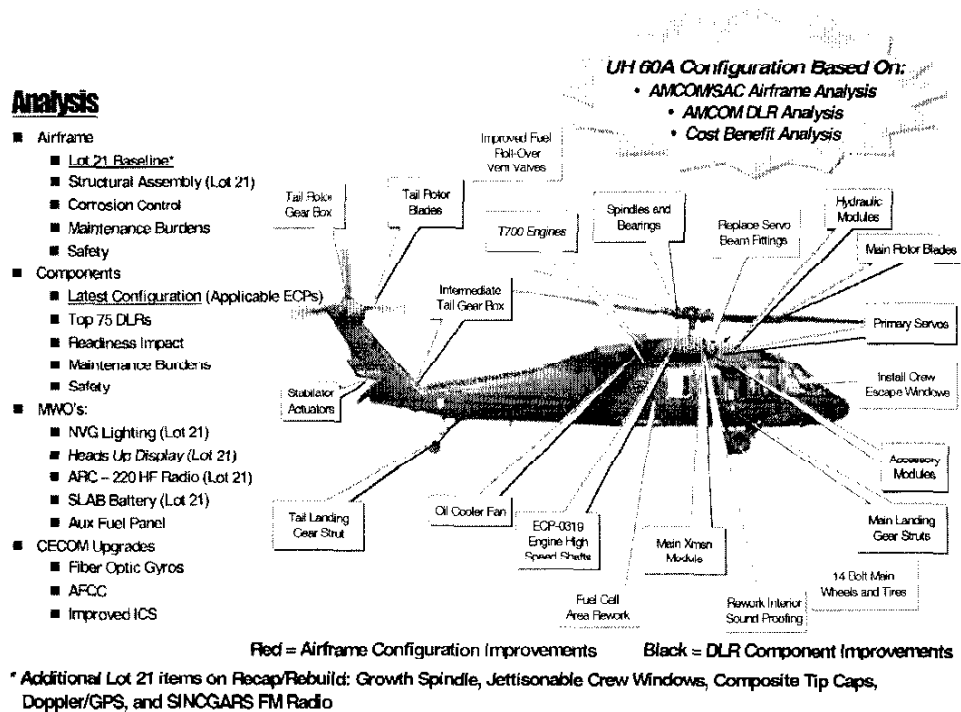
1. Sustain the UH-60A fleet until induction into the UH-60M Program.
2. Enhance safety and readiness, and reduce maintenance burdens.
3. Reduce the rate of growth of O&S cost.
4. Ensure Recap standards have been established and Recap components are available to support the UH-60M Program.
5. Exploit enhancements common to both aircraft by synergistically linking the two programs.

b. The Recap Program will begin rebuilding aircraft at the Corpus Christi Army Depot (CCAD) in FY02. The production rate of 20 aircraft per year will be achieved in FY 05.

Technical Description.

a. The aircraft will be disassembled and undergo a detailed inspection. Airframe defects will be repaired, corrosion prevention measures applied and selected Engineering Change Proposals (ECPs) incorporated. Although not part of the UH-60A to A Recap/Rebuild funded program, the application of outstanding Modification Work Orders (MWOs) will be coordinated with AMCOM. This will ensure the delivery of the most current configured aircraft to the field. A series of selected airframe structural reinforcements developed and incorporated on other UH-60 variants is being reviewed and analyzed to determine suitability for application during the Recap/Rebuild process. This analysis will be completed during the Program Definition Phase.

b. The airframe will then be rebuilt and recapitalized components, including the recapitalized T700-GE-700 engines, installed. The existing component overhaul lines will be converted to National Maintenance Program Standards (either revised or new DMWRs for DLRs or new NMWRS for Field Level Repairables). A review of repairables for the UH-60 resulted in the selection of 75 AMCOM airframe, 10 AMCOM engine, and 13 Communications-Electronics Command (CECOM) DLRs for in-depth engineering analysis to determine potential Recap benefit.



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Figure 1. UH-60A Baseline Configuration (Prior to Cost/Benefit Analysis)

c. KAPTON wiring, due to safety implications, is identified for replacement. Replacement, however, is an unfunded Aircraft Procurement Army (APA) requirement. The Project Office is working with Headquarters, Department of the Army (HQDA) (the Army, G3 and the Army, G4) action officers to obtain the necessary funding. This program is expected to improve system reliability, readiness, and safety.

THE UH-60M RECAP/ UPGRADE (UH-60M) PROGRAM

Program Description.

a. The UH-60M, a Research, Development, Test, and Evaluation (RDTE)/APA funded program, incorporates a blocked approach to achieve its Recap/Upgrade objectives. The UH-60M leverages mature technologies for immediate low-risk payoff. Aircraft are "near zero-timed" to reduce average fleet age. Replacing UH-60A engines and drive trains (60 percent of the fleet) with UH-60L components and T700-GE-701D engines reduces O&S costs while increasing performance. Digital avionics and communications enable operations on the battlefield of the future.

Commonality with other Army and sister service helicopters is sought to reduce development and sustainment costs.

b. The Block 2, Future Utility Rotorcraft, effort will be initiated when the required advanced propulsion technology is available to meet the greater lift and range requirements. Avionics, communications, and aircraft survivability technologies that mature during this period will also be incorporated.

c. The UH-60M Program is in the SDD Phase. As part of this effort, Sikorsky Aircraft Corporation was awarded a contract in May 2001 to integrate, test and qualify mature technologies to modify UH-60A and UH-60L aircraft to the UH-60M configuration. Following a Milestone C decision in 2nd Quarter (Qtr) FY04, a Low Rate Initial Production (LRIP) contract will Recap/Upgrade 25 aircraft to support operational test, prove out processes, and provide a ramp-up to full rate production. A study is being conducted to determine the cost/benefit impacts of a contractor/depot partnership during the full rate Recap/Upgrade phase.

d. During the full rate Recap/Upgrade production phase (beginning in FY06), aircraft will undergo Recap/Upgrade to the UH-60M configuration. At the same time, new UH-60M aircraft will be produced; a steady annual procurement rate of 90 Recap/Upgrade aircraft is sought.

UH-60M SYSTEM DESCRIPTION

Overview.

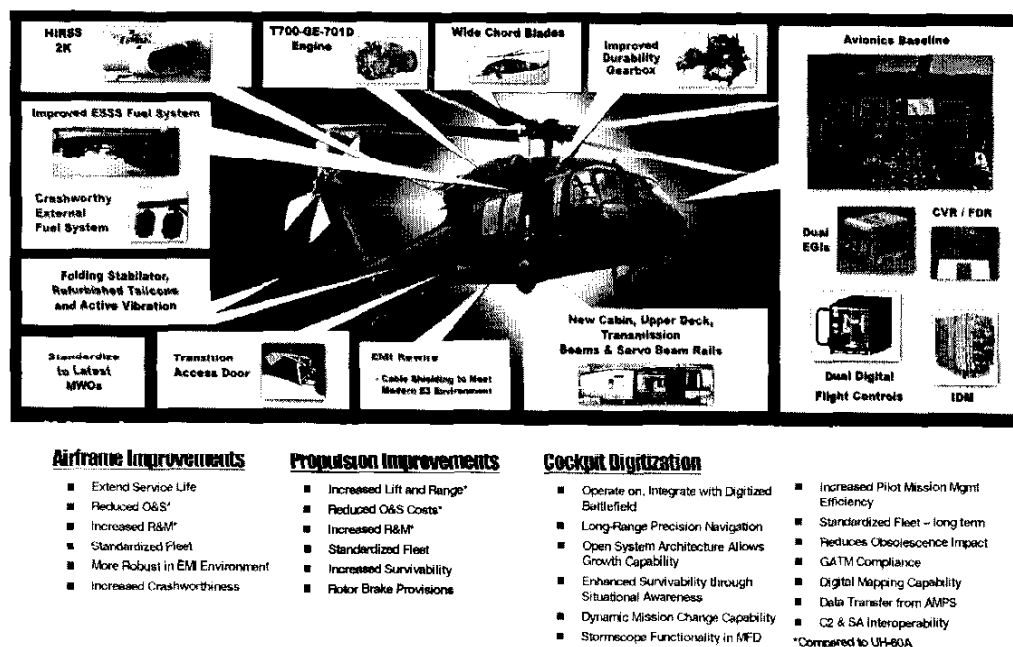
The UH-60M may be produced from the assembly line or recapitalized/upgraded from UH-60A, L, or Q aircraft. The UH-60M is based on the UH-60L Lot 21 configuration with improvements to airframe, engines, electrical system, main rotor blades, Flight Control Computer (FCC), and cockpit/avionics.

Configuration.

a. **Airframe** improvements include replacement of the cabin and transition sections, stabilator, and crew seats, and refurbishment of tail cone, vertical pylon, airframe vibration absorption devices, and troop seats. Major airframe load paths are strengthened to accommodate the increased Wide Chord Blade (WCB) capability and the aircraft usage spectrum is modified to reflect growth in mission weight. The External Stores Support System (ESSS) hard points, supporting the Extended Range Fuel System (ERFS), will be added to UH-60A Model aircraft. The ERFS will be modified to a Crashworthy External Fuel System (CEFS), which provides increased safety should a fuel tank be struck by small arms fire or in the event of an aircraft crash. Electrical wiring is replaced to meet the Electromagnetic Environmental Effects (E³) requirements and accommodate new electrical systems designs.

The current Stability Augmentation System (SAS)/Flight Path Stabilization computer is replaced with dual digital flight controls.

b. Propulsion improvements include modifying all T700-GE-700 (UH-60A) and T700-GE-701C (UH-60L) engines to the T700-GE-701D configuration to improve lift, range, reliability and reduce O&S costs. The UH-60M will use the WCB, which provides increased lift, and will help offset the lift lost due to the increased mission weight of the UH-60M. The Improved Durability Gearbox (IDGB), capable of receiving the increased torque associated with the WCB and engine upgrades will replace the older, less reliable UH-60A transmissions. The engine exhaust system includes an improved Hover Infrared Suppression System (HIRSS).



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Figure 2. UH-60M Baseline Configuration (As of Preliminary Design Review)

c. The avionics incorporate a communications/navigation MIL-STD-1553 data bus, Control Display Units, four Multi-Function Displays (MFDs), and hardware and software necessary to facilitate digital communications via the Improved Data Modem (IDM). Cockpit improvements include a digital moving map and the ability to present primary flight instruments and Stormscope data on the MFDs. The UH-60M includes a Cockpit Voice Recorder (CVR)/Flight Data Recorder (FDR). The CVR/FDR will record all crew intercom voice, radio voice, and data messages. The CVR/FDR will be crash survivable and equipped with a locator beacon.

UH-60A to A RECAP/REBUILD/UH-60M RECAP/UPGRADE METRICS

a. The high level performance metrics will be used to measure the success of the UH-60 Recapitalization program. These metrics will provide the PM with the necessary information to monitor and assess the effectiveness of the program:

1. O&S Cost Per Flight Hour Prediction (UH-60A/M).
2. Restoration of inherent Reliability for Recapitalized components (UH-60A/M).
3. Reduce average fleet life (UH-60M).

b. The progress in achieving the objective Mean Time Between Replacement (MTBR) values identified in Section V will be monitored to determine the extent to which the program is meeting the "like new" performance goal.

c. The methodologies to obtain the required data are being developed and coordinated with the BPI. The data collection effort will be developed and coordinated with AMSAA. The Program Office intent is to maximize the benefits of the existing AMSAA data collection effort.

d. A detailed Data Collection Plan (DCP) is being drafted by the PMO. It will evolve as details relative to the Army's data collection efforts becomes more defined. The DCP will be finalized 1st Qtr FY03. Data collection efforts will consist of the following:

1. Lead the Fleet: assign one aircraft to Fort Rucker (UH 60A to A Recap/Rebuild). (Note: UH PMO has recommended this course of action to HQDA; it has not yet been approved)
2. AMSAA data collection.
3. Supply Data:
 - a. Demand History.
 - b. DA Form 2410 Tracking System.
 - c. Operations and Support Management Information System (OSMIS).
 - d. Tail Number Sequence Listing (Internal Utility PMO tracking system).
 - e. Central Demand Data Base (CDDB) The proponent is the Logistics Support Activity (Logistics Support Agency).

a. The UH-60M's analytical performance is being tracked and will be assessed (analytically and/or by test) during the SDD phase to verify the airframe, propulsion, and cockpit digitization requirements are met. The digitization requirements are basically incorporation of a moving map and Joint Variable Message Format (JVMF) with JVMF defined as present position and free text messages.

b. The UH-60M should realize an O&S cost reduction from \$2,304 /hour (UH-60A) to \$1,765/hour (\$FY99). This projection is based on a 1999 review of OSMIS data utilizing a four-year average of the UH-60A/L fleet. This projection will be verified by future analysis of OSMIS data.

UH-60A AND UH-60M TOP DLR COST DRIVERS (The DLRs identified in the table below constitute the UH-60A/M top cost drivers. The Mean Time Between Replacement (MTBR) is subject to adjustment following trend analysis).

| Component | National Stock Number (NSN) | Current Average MTBR (FEB 02) | Objective MTBR (Hrs) |
|-------------------------|-----------------------------|-------------------------------|----------------------|
| T700 Engine | 2840-01-070-1003 | 825 | 1098 |
| Transmission | 1615-01-375-5847 | 1567 | 1912 |
| Main Rotor (M/R) Blade | 1615-01-106-1903 | 1064 | 1429 |
| Tail Rotor Gearbox | 1615-01-376-5089 | 1620 | 1664 |
| Blade, Rotary Wing, T/R | 1615-01-113-8188 | 1228 | 1506 |
| Servo Assembly, Primary | 1650-01-143-1226 | 2404 | 2682 |
| Actuator, Stabilator | 1680-01-261-2044 | 967 | 1123 |
| Servo Cylinder, T/R | 1650-01-305-6954 | 1175 | 1308 |
| Gearbox Input Module | 1615-01-353-3825 | 1980 | 2000 |
| AFCS | 6610-01-119-7180 | Not currently tracked | 2400 |

Note 1: MTBR values calculated as a mathematical mean using censored and uncensored data for selected components.

Table 1. UH-60A and UH-60M Top DLR Cost Drivers

c. The T700 engine, the UH-60A Model transmission and the main rotor blades will be overhauled to the DMWR/NMWR standard and installed on the UH-60A to A Recap aircraft.

d. The following actions will be taken in support of the UH-60M:

1. The T700 (UH-60A) and T701C (UH-60L) engines will be modified to the T701D configuration.

2. The UH-60A Model transmissions will be replaced by the Improved Durability Gearbox (IDGB).

3. The WCB will replace the main rotor blade.

e. The UH-60A AFCS is replaced by the Advanced Flight Control Computer (AFCC), which addresses *obsolescence and improves reliability*. The UH-60M will be equipped with the Dual Digital Automatic Flight Control System (DDAFCS).

ANNEX A TO UH-60 PERFORMANCE PLAN AND AGREEMENT

All signatories agree to the following:

a. This is a living document and is current as of July 3, 2002. Any changes to the PPA will be coordinated with all parties concerned.

b. The Methods of Performance Measurements outlined above.

c. The BPI, in coordination with all parties, will track results and provide tailored reports.

d. The Recap performance metrics established in Table 1 of this agreement.

e. The BPI will report tracking results to Army Senior Staff.

f. The PM, Utility Helicopters, in coordination with all parties, will assist with metric development to be used in tracking execution.

g. The PM, Utility Helicopters, in coordination with signatories, will supply data to BPI.

h. The warfighters will ensure continued emphasis on accurate data reporting.

i. The warfighters will facilitate/authorize HQDA liaison visits when necessary.

j. The PM, Utility Helicopters will provide updates to induction/distribution schedules, performance standards, and baselines whenever necessary to BPI.

k. The HQDA will furnish funding details as requested but at least monthly.

l. The DASA (CE) will validate cost and economic analysis of Recap efforts that have been reviewed and accepted by the Major Command (MACOM) and Major Subordinate Command cost analysis organizations and perform independent evaluations and analysis when applicable.

m. The U.S. Army Materiel Command will provide independent evaluations and analyses to be conducted by AMSAA.

AGREEMENT DATE: July 3, 2003

APPROVED BY:

AMC

COL Moses Whitehurst Jr. October 2, 2002

FORSCOM

(Representing Warfighters)

Mr. James DeMartini/s-December 20, 2002

TRADOC

System Management

CW3 Ernest Nickles/s-January 28, 2002

PEO

MG Joseph Bergantz/s-May 20, 2002

PM

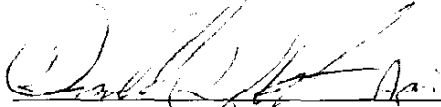
(Utility Helicopters)

COL William Lake, Jr./s-May 20, 2002

DASA (CE)

Mr. Robert Conley/s-January 3, 2002

for ASA(ALT)

 April 3, 2003